

**DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection**

N732038957

FACILITY: MAHLE Industries, Inc.		SRN / ID: N7320
LOCATION: 23030 MAHLE DRIVE., FARMINGTN HLS		DISTRICT: Southeast Michigan
CITY: FARMINGTN HLS		COUNTY: OAKLAND
CONTACT: Annie Kushner, EHS/Quality Coordinator		ACTIVITY DATE: 03/17/2017
STAFF: Sebastian Kallumkal	COMPLIANCE STATUS: Compliance	SOURCE CLASS: SM OPT OUT
SUBJECT: Onsite Inspection		
RESOLVED COMPLAINTS:		

On Friday, March 17, 2017, Michigan Department of Environmental Quality-Air Quality Division (MDEQ-AQD) Staff Sebastian Kallumkal conducted a targeted, unannounced inspection at MAHLE Industries, Inc. (Mahle) located at 23030 Mahle Drive in Farmington Hills, Michigan. The purpose of the inspection was to determine compliance with the Federal Clean Air Act; Article II, Part 55, Air Pollution Control of Natural Resources and Environmental Protection Act, 1994 Public Act 451; Michigan Department of Environmental Quality, Air Quality Division (MDEQ-AQD) Rules; and Permit-To-Install (PTI) Number 295-03F. This PTI was issued to modify the existing test cell 2 (EU-TCcell2) by increasing the maximum engine horsepower (hp) from 300 to 453 hp.

I arrived at the facility at about 9:30 AM. I met Ms. Annie Kushner, EHS/Quality coordinator (Ph: 248-735-3538; Fax: 248-735-3458), Mr. Hal Johnson, Manager and Head of Facilities and Environmental, Chris Lewandowski, Senior Test Engineer and Jeff King, Quality Specialist (Phone: 248 921 2397). I introduced myself and stated the purpose of the visit. During the pre-inspection meeting, we discussed the facility's operations.

The facility is using all five test cells (dynamometers) of FG-TESTCELLS in PTI No. 295-03F. It is only using gasoline and diesel as fuel in the engines even though other fuels such as hydrogen, compressed natural gas (CNG), E85/Ethanol and liquefied petroleum gas (LPG) are permitted to be used.

We also discussed the fuel monitoring for the test cells. Chris and Jeff explained that the facility uses Veeder Root System to monitor the fuel usage. It measures the fuel level in the tanks and prints daily measures. The meters are calibrated annually by an outside company.

The canister test system (FG-CANISTER) is still at the facility but has not been used since October 2015. They are planning to use this testing soon. They are using fuels such as gasoline and butane in this testing process.

She informed me that in 2013 the facility installed three brand new, diesel fired (compression ignition), 300 KW, Generac, emergency generators to power the server system. Mr. Hal explained that each generator has self-contained (623-gallon capacity) diesel tank and the generators haven't been used for emergency purpose since the installation, but are tested simultaneously for 30 minutes weekly.

I informed them about the permit to install exemption pursuant to Rule285(2)(g), compliance with Rule 278 and requested to calculate potential to emit to verify whether the emission of criteria pollutants would exceed the major source threshold. Mr. Hal informed me that they had considered the air permit, but their consultant had told them that the engines didn't need a permit. He provided me the engine specifications (Model MD300 Industrial Diesel Generator Set, EPA Certified Stationary Emergency). Later, he emailed me the EPA certificate of conformity and Statement of Exhaust Emissions 2013 FPT Diesel fueled generators.

Mahle employs about 425 people and it operates 1 Shift (8:00 AM until 5:00 PM), 5 days (Monday through Friday) per week. MAHLE Industries, Inc. is a Tier One automotive industry

supplier and is an R&D Head Quarters for Mahle North America. It is involved in the product development and testing of diesel and gasoline automotive engines. The facility designs and tests pistons, rods, air-intake systems, piston rings, cam shafts and other components of the engines. It uses five dynamometer test cells, under various loading conditions and utilizing various fuel formulations for engine testing (durability, friction, efficiency, etc.) for the development of new engines. It also conducts cause-analysis determinations on the parts after those have been tested.

The facility is not currently using fuels such as Hydrogen, Liquefied Petroleum Gas (LPG) or Compressed Natural Gas (CNG) even though it is permitted to use these fuels in the engine testing. The facility has one eddy current, water cooled (EU-TCell5 aka Engine 135) and four electric dynamometers (EU-TCell1 aka Engine 131, EU-TCell2 aka Engine 132, EU-TCell3 aka Engine 133 & EU-TCell4 aka Engine 134). The facility uses Engine 133 (gasoline & diesel engines) and Engine 134 (diesel & gasoline engines) to generate electricity (regenerative energy) during engine testing. Engine 135 is used for noise testing and is rarely used. Engine 131 is also equipped with a motor (AC dyno)

MAHLE used to design and test carbon canisters which absorb gasoline vapors before they escape from automotive fuel tanks. This testing consists of saturating the carbon canisters with butane or gasoline vapors and quantitatively measuring the emission of gasoline and butane vapors from them. They told me that the facility may restart the process in the future.

Later Mr. Lewandowski and Ms. Kushner accompanied me for an inspection of the facility. We visited the five test cells. Four of the dynamometer cells are used to test various engine parts at variable speed and loads for a set period. The fifth test cell is used to conduct Noise Vibration Frequency (NVF) testing on engines and is used only a few times per year. The facility also conducts fatigue testing for individual parts. The engine tests last for many days at each time. Mr. Lewandowski explained the testing performed in each cell.

Engine 131-tests gasoline and diesel engines, not operating at the time of inspection, tests for fuel consumption, parts durability, component level testing, etc.

Engine 132-tests primarily gasoline but capable of testing diesel engines, not operating at the time of inspection

Engine 133- primarily tests diesel engines but can test gasoline engines, not operating at the time of inspection

Engine 134- primarily gasoline but capable of testing diesel engines, not operating at the time of inspection

Engine 135-Eddy current dynamo. Not operating at the time of the inspection. Short term testing.

Mr. Hal accompanied us to inspect the three Generac emergency generators. All engines are subject to 40 CFR 60, Subpart IIII-New Source Performance Standard (NSPS) for diesel fired engines. Compliance with Subpart IIII deemed compliance with 40 CFR 63, Subpart ZZZZ-National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Reciprocating Internal Combustion Engines (RICE). These engines are EPA certified. This complies with NSPS requirements. All engines are equipped with hourly meters. The current hours are:

Generator 1- 176.7 hours

Generator 2- 176.3 hours

Generator 3- 176.8 hours

Hal stated that they are using low sulfur fuel. The SDS for diesel fuel shows that it contains less than 15ppm sulfur.

The NMHC + NO_x = 6.2 g/kw-hr, for 2013 engines (Table 2 to 40 CFR 1042.101, Tier 3 Standards for Category 2 engines, displacement = 7 to 15 L, KW <2000, 2013+ Model year).

Potential to emit (PTE) for NO_x for one of these EPA certified engine, based on a 500 hr/yr usage, is

$$\begin{aligned}\text{NO}_x \text{ (lb/yr)} &= 6.2 \text{ g/kw-hr} \times (\text{lb}/454 \text{ g}) \times 300 \text{ kw} \times 500 \text{ hr/year} \\ &= 2048 \text{ lb/yr}\end{aligned}$$

(The statement of exhaust emissions for 2013 FPT diesel fueled generator show that the exhaust NMHC + NO_x = 3.8 g/kw-hr.)

$$300 \text{ KW} = 3.034 \text{ MMBTU/hr (based maximum fuel flow @100\% standby load).}$$

Therefore, these engines are exempt from permit to install pursuant to R336.1285(2)(g) and the PTE for all engines combined is less than Clear Air Act Title V major source thresholds.

Later, Ms. Kushner accompanied me to the canister testing units. All (6) the test equipment is still in the room. They want to keep those available for possible use in the future.

The facility also has a machine shop area which is used to perform minor modifications and alterations to metal parts. The machine shop area included one CNC (computer numeric control) machines; two manual milling machines, lathes, ban saws and grinders. The facility also has a soda blaster to clean parts. The exhaust from the blaster is exhausted inside the building.

Following is a discussion of the facility's compliance with the permit requirements.

FG-TESTCELLS

Special Condition I.1: This condition sets a NO_x emission limit of 0.138 lb per gallon of diesel used. AQD has not requested verification of this limit. This emission limit was not verified.

Special Condition I.2: This condition sets a NO_x emission limit of 0.15 lb per gallon of liquefied petroleum gas (LPG), compressed natural gas (CNG), hydrogen, or E85/ethanol, or gasoline. AQD has not requested verification of this limit. This emission limit was not verified. The facility is not using LPG, CNG or Hydrogen fuel.

Special Condition I.3: This condition sets a NO_x emission limit of 24.9 tons per 12-month rolling time period as determined at the end of each calendar month. As of December 2016, the 12-month rolling NO_x emissions were 3.1 TPY. The highest emissions per month was 0.9 tons in March 2016.

Special Condition I.4: This condition sets a CO emission limit of 0.0137 lbs per gallon of diesel used. AQD has not requested verification of this limit. This emission limit was not verified.

Special Condition I.5: This condition sets a CO emission limit of 2.5 lb per gallon of LPG used. AQD has not requested verification of this limit. This emission limit was not verified.

Special Condition I.6: This condition sets a CO emission limit of 2.1 lb per gallon of compressed natural gas (CNG) used. AQD has not requested verification of this limit. This emission limit was not verified.

Special Condition I.7: This condition sets a CO emission limit of 3.12 lb per gallon of E85/ethanol used. AQD has not requested verification of this limit. This emission limit was not verified.

Special Condition I.8: This condition sets a CO emission limit of 3.12 lb per gallon of gasoline used. AQD has not requested verification of this limit. This emission limit was not verified.

Special Condition I.9: This condition sets a CO emission limit of 3.12 lb per gallon of hydrogen used. AQD has not requested verification of this limit. This emission limit was not verified.

Special Condition I.10: This condition sets a CO emission limit of 89.9 tons per 12-month rolling time period as determined at the end of each calendar month. As of December 2016, the 12-month rolling CO emissions were 4.0 TPY and this is the highest monthly emissions was 2.5 TPY in April 2016.

Special Condition II.1: This condition limits the combined usage of gasoline and E85/ethanol in FG-TESTCELLS to 45,634 gallons per 12-month rolling time period as determined at the end of each month. As of December 2016, the 12-month rolling time period usage of these fuels (gasoline) in FG-TESTCELLS was 2,356 gallons. The highest usage of gasoline was 1,555 gallons in April 2016.

Special Condition II.2: This condition limits the usage of diesel fuel in FG-TESTCELLS to 297,682 gallons per 12-month rolling time period as determined at the end of each month. As of December 2016, the 12-month rolling time period diesel fuel usage was 42,671 gallons. The highest monthly usage was 13,677 gallons in March 2016.

Special Condition II.3: This condition limits the usage of liquefied petroleum gas (LPG) fuel in FG-TESTCELLS to 4,300 gallons per 12-month rolling time period as determined at the end of each month. The facility has not used any LPG fuel in 2010 and to present.

Special Condition II.4: This condition limits the usage of compressed natural gas (CNG) fuel in FG-TESTCELLS to 4,300 gallons per 12-month rolling time period as determined at the end of each month. The facility has not used any CNG fuel since 2010.

Special Condition II.5: This condition limits the usage of hydrogen fuel in FG-TESTCELLS to 4,300 gallons per 12-month rolling time period as determined at the end of each month. The facility has not used any LPG fuel since 2010.

Special Condition VI.1 This condition requires the permittee to complete all required calculations in a format acceptable to the AQD District Supervisor by the 30th day of the calendar month, for the previous calendar month, unless otherwise specified in any recordkeeping, reporting, or notification special condition. The facility appears to be in compliance with this condition.

Special Condition VI.2: This condition requires that the permittee keep, in a satisfactory manner, monthly and previous 12-month NOx emission calculation records for FG-TESTCELLS, as required by SC I.3. Also requires that the permittee keeps all records on file for a period of at least five years and make them available to the Department upon request. The facility appears to be in compliance with these requirements based on the records provided.

Special Condition VI.3: This condition requires that the permittee keep, in a satisfactory manner, monthly and previous 12-month CO emission calculation records for FG-TESTCELLS, as required by SC I.10. Also requires that the permittee keeps all records on file for a period of at least five years and make them available to the Department upon request. The facility appears to be in compliance with these requirements based on the records provided.

Special Condition VI.4: This condition requires that the permittee keep, in a satisfactory manner, monthly gasoline, LPG, CNG, hydrogen, E85/ethanol and diesel use records for FG-TESTCELLS, as required by SCII-1 through SC II-5. Also requires that the permittee keeps all records on file for a period of at least five years and make them available to the Department upon request. The facility appears to be in compliance with these requirements based on the

records provided.

FG-CANISTER

Special Condition II.1: This condition limits the gasoline/Stoddard solvent usage for FG-CANISTER to 4,963 pound per 12-month rolling time period as determined at the end of each calendar month. As of February 2017, facility's Stoddard solvent usage is 0 lb based on a 12-month rolling period. Stoddard solvent usage has been 0 lb since January 2006.

Special Condition II.2: This condition limits the total butane usage for FG-CANISTER to 4,635 pounds per 12-month rolling time period as determined at the end of each calendar month. As of September 2015, facility's butane usage based on 12-month rolling time period as determined at the end of each calendar month (October 2014-September 2015) was 378.9 pounds. The canister test was conducted last time in September 2015 and the usage for this month was 42.1 lbs. The facility has not used butane for 2016 and to-date 2017.

Special Condition VI.1: This condition requires the facility to keep, in a satisfactory manner, monthly and previous 12-month gasoline and butane use records for FG-CANISTER. Also, further requires that all records shall be kept on file for a period of at least five years and made available to the department upon request. The facility has kept appropriate records while the canister tests were performed.

Special Condition VIII-1: This condition requires that the exhaust gases from FG-CANISTER be discharged unobstructed vertically upwards to the ambient air and specifies the stack dimensions. Compliance with stack dimensions were not verified during this inspection. The facility has not been performing the tests since October 2015.

Conclusion: Based on this inspection, MAHLE Technology, Inc. appears to be in compliance with the conditions of PTI #295-03F and all other applicable air regulations. The records cited are attached to this report.

NAME Sebastian Kallunkal

DATE 4/26/2017

SUPERVISOR 